

REMARKS

Favorable reconsideration of this application, in light of the preceding amendments and following remarks, is respectfully requested.

Claims 1-20 are pending in this application. Claim 1 is amended and no claims have been cancelled. Claims 19-20 are newly added. Claim 1 is the sole independent claim.

Applicants note with appreciation the Examiner's acknowledgement that certified copies of all priority documents have been received by the U.S.P.T.O. Action, summary at 12.

Applicants also respectfully note the present action indicates that the drawings have been accepted by the Examiner. Action, summary at 10.

Example Embodiment of the Present Application

A non-limiting example embodiment of a current measuring device having an artificial lipid bilayer membrane is explained on page 45 of the present specification. In using the current measuring device of example embodiments a highly durable artificial lipid bilayer membrane, which is stable also in a direction parallel to the bottom of the solution chamber, may be more easily formed, and it is possible to measure a channel current and optically observe an ion channel at the same time. In addition, the current measuring device of example embodiments may be made smaller, so that a smaller sensor may be manufactured.

Rejections under 35 U.S.C. § 103

Claims 1, 6-12 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Toru Ide et al. "An Artificial Lipid Bilayer Formed on An Agarose-Coated Glass for Simultaneous Electrical and Optical Measurement of Single Ion Channels" (Biochemical and Biophysical Research Communication Vol. 265, No. 2, p. 595-599, 1999), in view of Vogel et al. (US Patent No. 7,201,836). Applicants respectfully traverse this rejection for the reasons detailed below.

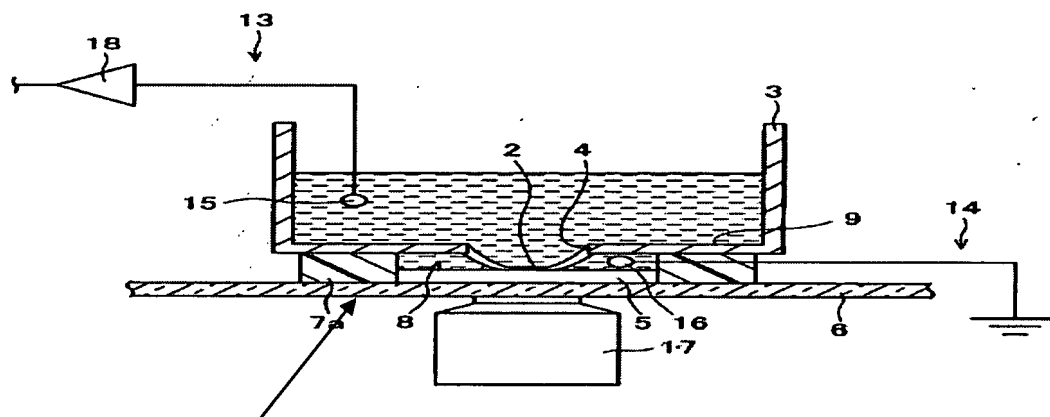
Independent claim 1 recites "the lower solution chamber is provided below the upper solution chamber and surrounded by the bottom plate and the interval keeping member" and "the artificial lipid bilayer membrane formed on the membrane opening is swollen to a side of the lower solution chamber so as to be made thinner". Non-limiting example embodiments can be found at least on pages 12-13 of the specification.

The outstanding Office Action on page 3, lines 15-19, acknowledges that Toru Ide fails to disclose a bottom plate on which the support layer is placed, and an interval keeping member for keeping a predetermined interval between the upper solution chamber and the bottom plate, wherein the lower solution chamber is provided below the upper solution chamber and surrounded by the bottom plate and the interval keeping member and relies on the teachings of Vogel for this feature of claim 1.

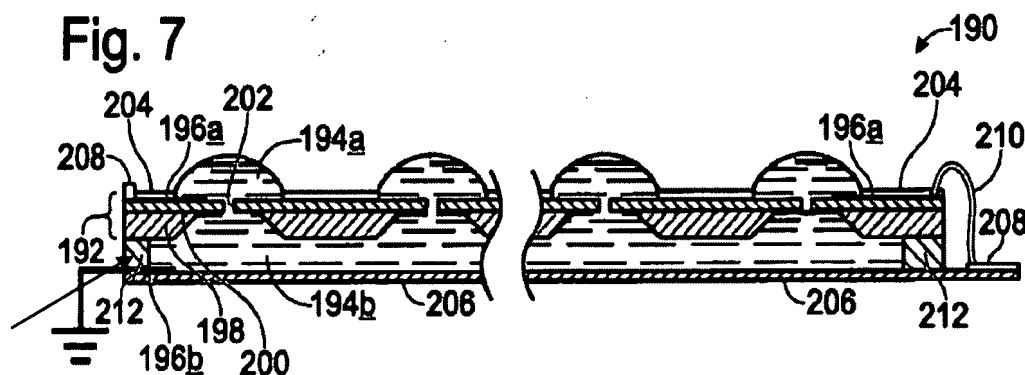
In addition to the above-identified deficiency of Toru Ide, Applicants respectfully submit that Vogel does not teach or suggest "the lower solution chamber is provided below the upper solution chamber and surrounded by the

bottom plate and the interval keeping member” as recited in independent claim

1. In FIG. 1 of the instant specification, the lower solution chamber 8 is surrounded by the support layer 5, the bottom plate 6 and the interval keeping member 7a.



In FIG. 7 of Vogel, the lower fluid compartment 194b is surrounded by the carrier plate 206, but **not** surrounded by the spacer (interval keeping member) 212.



Therefore, Vogel does not teach or suggest “the lower solution chamber is provided below the upper solution chamber and surrounded by the bottom plate and the interval keeping member” as recited in independent claim 1.

In addition, the technique described in Vogel has a vesicle or cell formed on the bilayer membrane that is bound to an aperture, but the artificial lipid bilayer membrane in Vogel is not formed on a membrane formation opening. In the device disclosed in Vogel, the aperture may be used to fix a vesicle or cell and to form a tight electrical seal. The aperture does not make the membrane thinner. Column 6, lines 60-65 of Vogel states that the aperture should be significantly smaller than the size of the sample, e.g., vesicle or cell. Therefore, Vogel does not disclose "the artificial lipid bilayer membrane formed on the membrane formation opening is swollen to a side of the lower solution chamber so as to be made thinner" as is recited in independent claim 1. Because Vogel does not disclose this feature of independent claim 1, one of ordinary skill in the art would not combine Toru Ide and Vogel in order to form a stable artificial lipid bilayer membrane.

Further, with respect to the proposed combination of Toru Ide and Vogel, Applicants respectfully submit that the combination is improper for at least the following reasons.

Applicants respectfully submit there is insufficient evidence in the record for modifying the artificial bilayer membrane of Toru Ide to incorporate the carrier plate and spacer of Vogel. An attempt to bring in the isolated teachings of the carrier plate and spacer of Vogel into the artificial bilayer membrane of

Toru Ide would amount to improperly picking and choosing from the different references without regard for the teachings of the references as a whole.¹

Still further, Applicants respectfully submit that even if one skilled in the art is motivated to combine the references of Toru Ide and Vogel, the result of the combination would still not teach or suggest the features of claim 1.

The Applicants maintain, therefore, that the Action does not present the required "convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references," *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985), and that this rejection may not be properly maintained absent such reasoning.

The Applicants, therefore, respectfully request that the rejection to Claim 1 under 35 U.S.C. § 103(a) be withdrawn.

Claims 6-12 and 14, dependent on independent claim 1, are patentable for the reasons stated above with respect to claim 1 as well as for their own merits.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection to independent claim 1 and all claims dependent thereon.

Furthermore, newly-added claims 19-20 are also allowable over Toru Ide in view of Vogel, at least by virtue of their dependency on independent claim 1.

¹ See *In re Ehrreich* 590 F2d 902, 200 USPQ 504 (CCPA, 1979) (stating that patentability must be addressed "in terms of what would have been obvious to one of ordinary skill in the art at the time the invention was made in view of the sum of all the relevant teachings in the art, not in view of first one and then another of the isolated teachings in the art," and that one "must consider the entirety of the disclosure made by the references, and avoid combining them indiscriminately.")

Allowable Subject Matter

Applicants appreciate that claims 4 and 5 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, it is submitted that claims 4 and 5 are presently allowable in view of the previous remarks.

New Claims

By the present Amendment, Applicants submit that claims 19-20 have been added. Support for new claims 19-20 can be found in at least in the Specification as originally filed. In particular, support for claims 19-20 can be found at least in paragraph [0054]. As such, Applicants submit that no new matter has been added.

CONCLUSION

In view of the above remarks and amendments, the Applicants respectfully submit that each of the pending objections and rejections has been addressed and overcome, placing the present application in condition for allowance. A notice to that effect is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned.

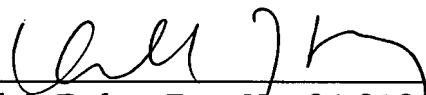
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Erin G. Hoffman, Reg. No. 57,752, at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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By


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